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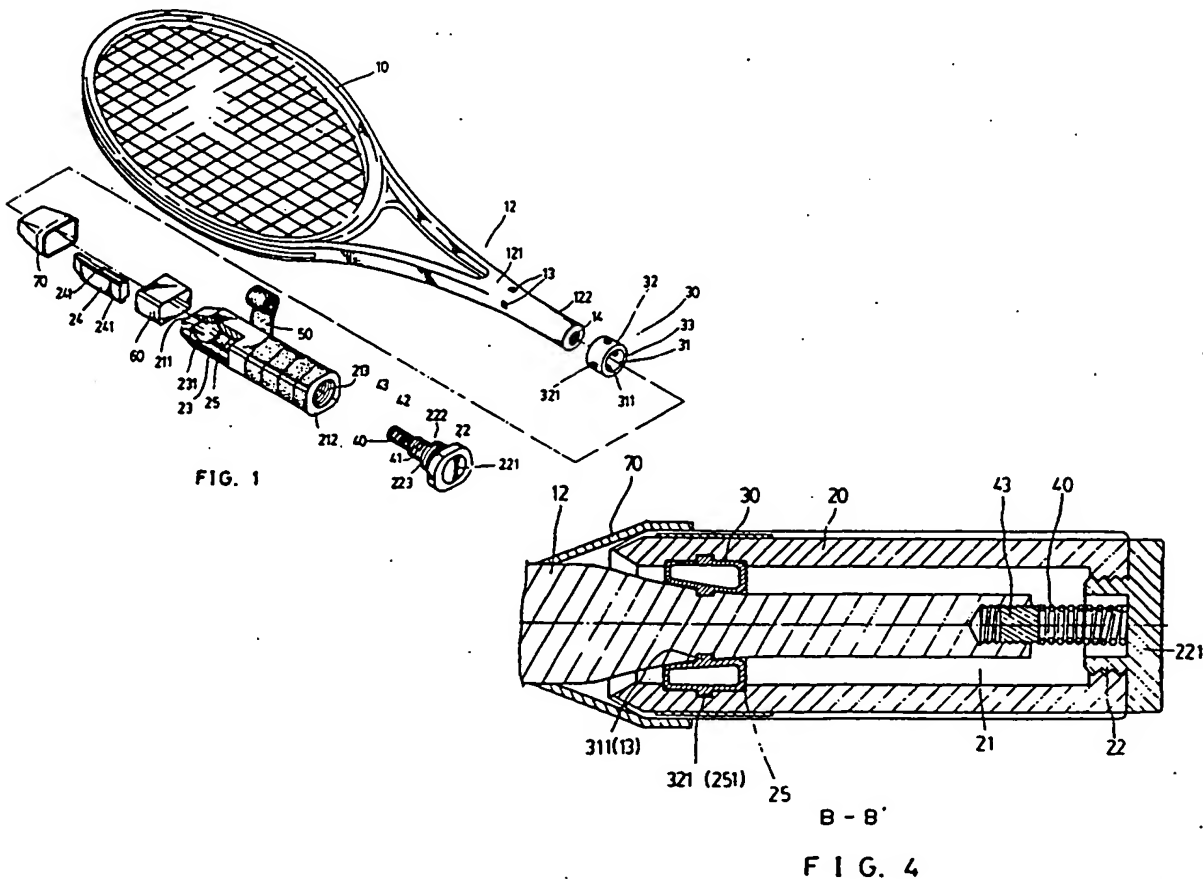
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(54) Shock absorbing racket

(57) A shock absorbing racket including a frame 10, for setting of catgut string to form a striking surface, with both ends formed into a shaft 12 extending backward along axial direction; and a hollow racket handle 20 connected to the shaft 12 of the frame 10 by means of sleeve joint. The shaft 12 is set inside the hollow handle 20, a cushion socket 30 made of elastic material is set between the handle 20 and the shaft 12, and a spring element 40 is set inside the handle 20 and arranged to pull up the shaft 12, so as to substantially absorb any shock resulted during striking against a ball, and to prevent from any athletic injury to the hand.

The socket 30 has an air sac that can be inflated to provide a pressure made according to personal physical condition.

A rubber ring 70 is provided on the shaft to seal gap between an aperture of the handle 20 and of the shaft 12 to prevent entry of water or dust.



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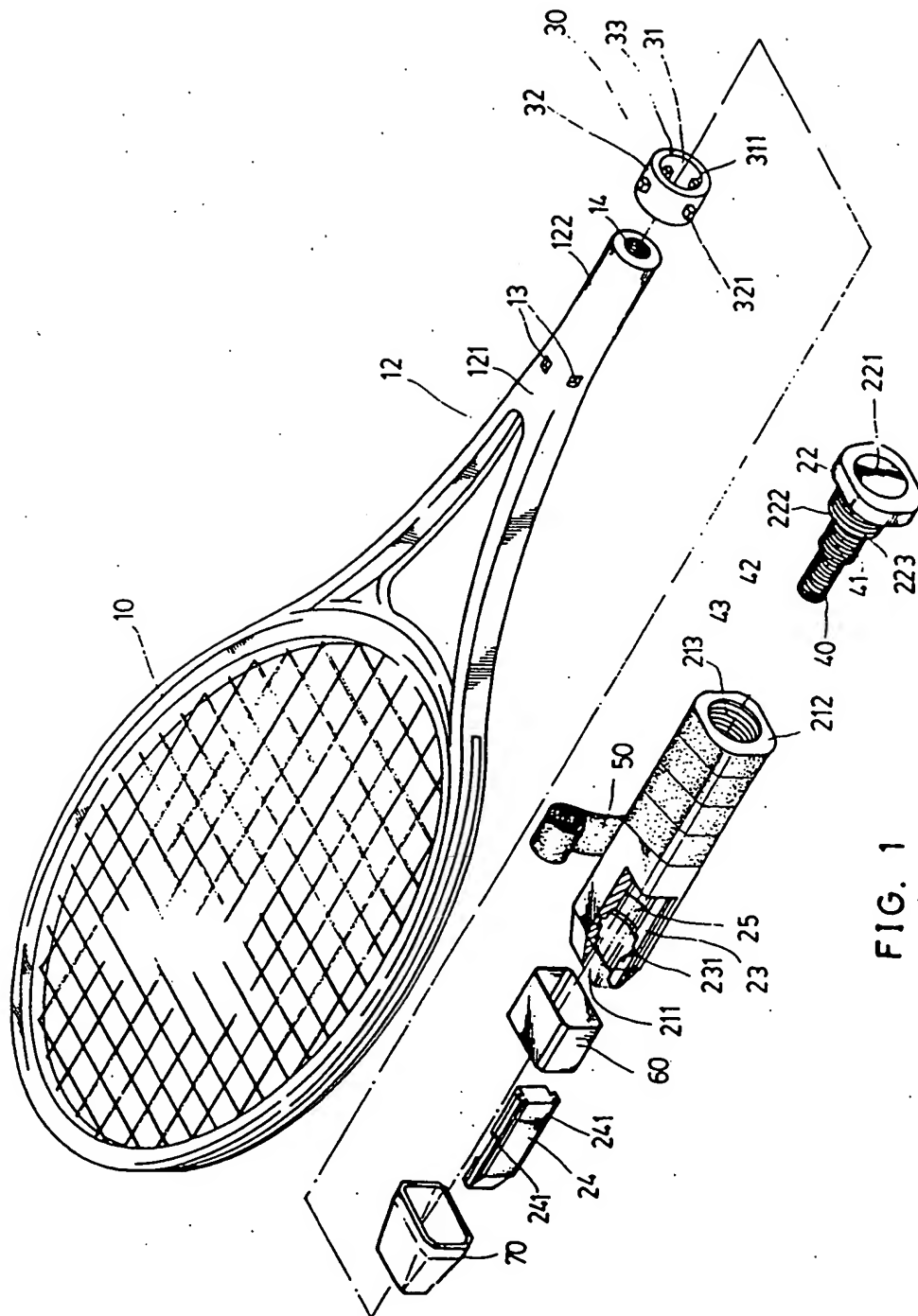


FIG. 1

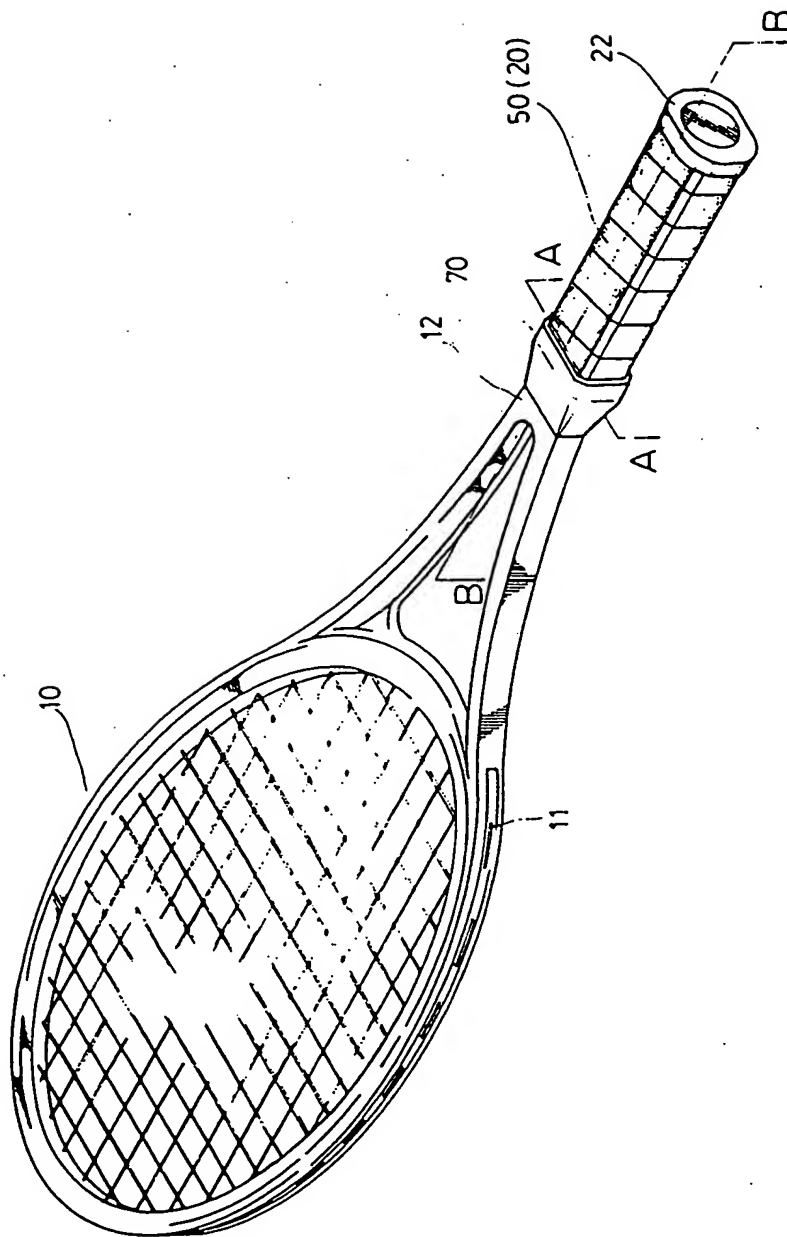


FIG. 2

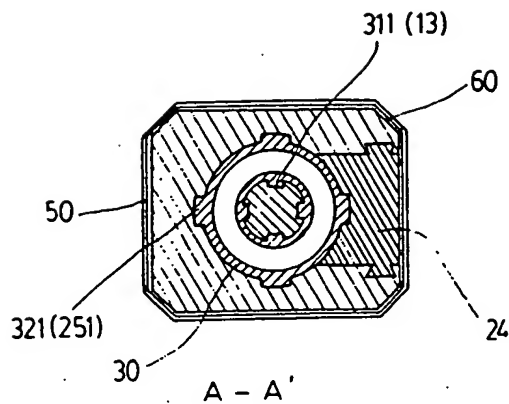


FIG. 3

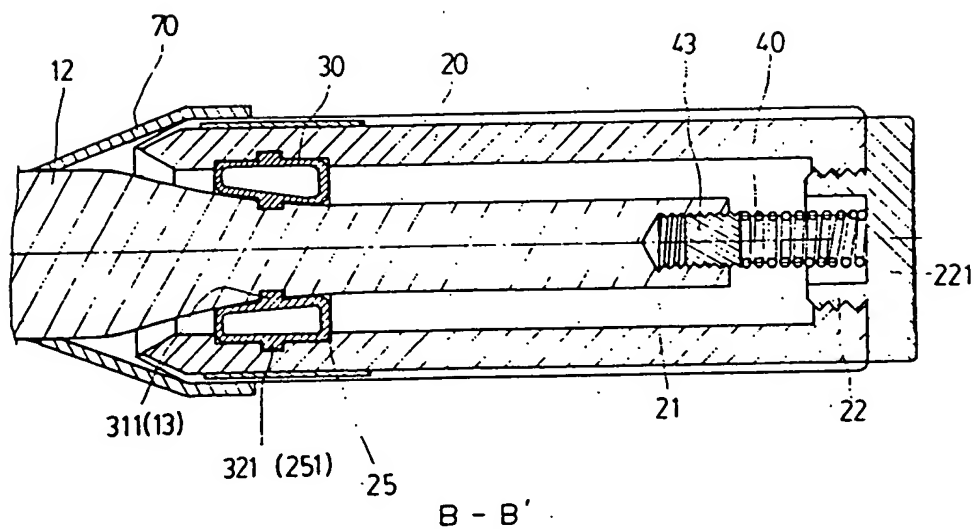


FIG. 4

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SHOCK ABSORBING RACKET

The present invention is related to a racket structure and, more particularly to a shock absorbing racket structure.

The athletic injury most frequently seen in tennis is the so called "tennis elbow", which is due to constant interference of shock transmitted from tennis racket to the elbow during striking. Conventional method to absorb the shock is normally to attach shock absorbing strips to the striking surface or to use shock absorbing material for threading of catgut string. However, conventional method can not substantially absorb the shock. More particularly, the attachment of shock absorbing strips may interfere with the applicable area and the performance of the striking surface. In fact, regular rackets have a common structural drawback, that is, the frame body is integrally made by means of shape-forming process and, more particularly the main shaft and the racket handle are integrally connected together. Therefore, the use of shock absorbing strips attached to striking surface can only absorb a small amount of the shock produced from striking of the racket against a ball and, the major amount of shock will be transmitted through main shaft to the racket handle to further be applied to the hand of the player (one may feel that one's hand is palsied). The more serious is the elbow which suffers the major part of the shock. After a long period of playing, the athletic injury of "tennis elbow" may be easy to occur.

The main object of the present invention is to provide a shock absorbing racket which can drastically absorb the shock resulted from striking of the racket against a ball so as to prevent from any possible hurt to the hand.

According to the present invention, a shock absorbing racket includes a frame for setting of catgut string to form a striking surface, with both ends formed into a shaft extending backward along axial direction; and a racket handle connected to the shaft of the frame by means of sleeve joint; and characterized in that the racket handle is an elongated hollow rod having an inner space made thereinside along axial direction for setting therein of the shaft of the frame, wherein a cushion socket made of elastic material is set between the racket handle and the shaft, and a spring element is set inside said racket handle to pull up said shaft, so as to substantially absorb any shock resulted during striking against a ball and to prevent from athletic injury to the hand.

The above and other objects, features and advantages of the present invention will become more apparent from the following detailed description quoted on the basis of the annexed drawings as hereunder.

Figure 1 is a perspective fragmentary view of a racket embodying the present invention.

Figure 2 is a perspective assembly view of the said preferred embodiment of the present invention.

Figure 3 is a sectional view taken on the line A-A of Figure 2.

Figure 4 is a sectional view taken on the line B-B of Figure 2.

Referring to Fig. 1, a shock absorbing racket is basically comprised of a frame (10), a racket handle (20), a cushion socket (30) and a spring element (40).

The frame (10) is arranged to surround an oval area, with a plurality of thread holes (11) made thereon around its circumference for setting of catgut string to form a striking surface, and with both ends formed into a shaft (12) extending backward along axial direction, wherein a plurality of spaced positioning notches (13) are made at the front portion (121) of the main shaft, and a bolt hole (14)

is made on the bottom end (122).

The racket handle (20) is an elongated hollow rod, having an inner space made thereinside along axial direction for setting therein of the shaft (12) of the frame (10), an aperture (211) made at the front for connection, a bolt hole (213) made at the rear end (212) for fixation thereto of a screw cap (22). As shown in Figure 1, the screw cap (22) includes a top cover surface (221) having a hollow neck (222) axially extending forward with an outer thread made on the neck (222) to match with the bolt hole (213) of the rear end (212) of the racket handle (20) for connection of the screw cap (22) with the racket handle (20) by means of screw joint. As shown in Fig. 4, there is also provided a hook means (224) made at the inner bottom of the hollow screw neck (222). An opening (23) for mounting is made on the racket handle (20) by one side of the aperture (211). A sliding track (231) is made on the racket handle (20) along axial way, parallelly disposed by both sides of the opening (23) for positioning of a slide block (24) which has side tongues (241) respectively made at both sides for sliding along the sliding track (231) respectively. A circular receiving chamber (25) is made inside the racket handle (20) near the aperture (211). Said receiving chamber comprises therearound a plurality of positioning notches (251).

The cushion socket (30) has a ring-shaped body made of shock absorber material, including an inner circular portion (31) and an outer circular portion (32), wherein the inner circular portion (31) and the outer circular portion (32) are having respectively a plurality of noses (311) and (322), as shown in Figure 3. The cushion socket (30) is set in the circular receiving chamber (25) with the noses (321) respectively set in the notches (251), and with the noses (311) of the inner circular portion (31) respectively set in the notches (13) of the shaft (12), so as to let the cushion socket (30) be firmly retained in the axial hole (21) between the shaft (12) of the frame (10) and the racket handle (20). The cushion socket (30) can be made of solid and resilient material. In the present preferred embodiment, it has an air-sac-like structure, similar to an air tire, including an air inlet valve (33) for inflation to adjust the pressure required.

The spring element (40) is a reinforced tension spring having one end (41) connected to the hook means (224) of the screw cap (22) through hook joint, which connection may be further reinforced through welding process or by means of screw joint, and having the other end (42) fixedly connected with a bolt neck (43) for connection to the bolt hole (14) of the shaft (12) of the frame (10) by means of screw joint so as to pull up the shaft (12).

By means of said component parts, a shock absorbing racket of the present invention may be assembled. With respect to the assembly process, please refer to Figures 1 and 2. The shaft (12) of the frame (10) is inserted from the aperture (211) of the racket handle (20) into the axial hole (21). During insertion of the shaft (12) into the axial hole (21), the cushion socket (30) is simultaneously set in the opening (23) letting the inner circular portion (31) be sleeved on the shaft (12) with the noses (311) respectively set in the notches (13) and letting the outer circular portion (32) be received in the circular receiving chamber (25) with the noses (321) respectively set in the notches (251) as shown in Figure 3. The cushion socket (30) is further inflated with air through the air inlet valve (33) to respectively press against the racket handle (20) and the front portion (121) of the shaft (12) so as to reinforce the positioning of the racket handle (20). The slide block (24) is further set along the sliding track (231) to cover the opening (23). Thus, a racket handle (20) is built up. Before winding up the racket handle (20) with an elastic bandage (50), a rigid hoop (60) is mounted to bind up the slide block (24) with the racket handle (20), as shown in Figure 4. In order to prevent from entrance of water or dust through the gap between the aperture (211) of the racket handle (20) and the shaft (12), a rubber ring (70) is provided to axially mount on the shaft (12) at the front of the aperture (211) to seal the gap. After the racket

handle (20) is wound up with the elastic bandage (50), the spring element (40) which is connected with the screw cap (22) at one end (41) through hook joint is screwed up with the bolt hole (213) of the rear end (212) of the racket handle (20) at the other end (42), and simultaneously, the bolt neck (43) which is fixedly connected with the other end (42) of the spring element (40) is screwed up with the bolt hole (14) of the shaft (12) of the frame (10) to complete the whole assembly procedure.

Please refer to figure 4 again. When in practice to strike a ball, the maximum shock comes from the shaft (12). Because the racket handle (20) is a hollow body, the shock resulted from stroke will primarily be absorbed by the cushion socket (30). The remainder shock which passes through the cushion socket (30) will further be transmitted backward to the spring element (40) which is set between the racket handle (20) and the screw cap (22), wherein the spring element (40) will be caused to vibrate so as to offset the shock. Therefore, little amount of shock is transmitted to the racket handle (20). The minimized aftershock which is transmitted to the racket handle (20) will be further absorbed by the elastic bandage (50). Thus the hand of the player is protected against hurt during striking a ball with the racket held by hand due to shock absorbing ability.

Because striking direction of the striking surface of a racket is controlled by means of the turning force applied through hand onto the front end of the racket handle (the area in front of the area where the hand is holding), the structure of the rear end of a racket handle does not interfere with the striking. In the present invention, the racket handle (20) is not entirely engaged with the shaft (12). However, because the racket handle (20) and the shaft are connected by means of the pressing force from the cushion socket (30) and by means of the engagement of the noses (311) and (321) of the inner and outer circular portions (31) and (32) with the notches (13) and (251) of the shaft (12) and the racket handle (20) while the spring element (40) is set between the bottom end (122) of the shaft (12) and the screw cap (22) of the racket handle (20), the shaft (12) and the racket handle (20) are firmly retained against displacement. Therefore, while striking against a ball, the shaft (12) does not displace against the racket handle (20) to interfere with the performance, and the direction of the striking surface of the racket is freely controlled by the player. In the above described embodiment, the cushion socket (30) is inflated with air to provide suitable pressure against the shaft (12) and the racket handle (20), which pressure may be adjusted personally according to player's physical condition.

In conclusion, the present invention is to provide such a shock absorbing racket to absorb any shock resulted from striking of the racket against a ball, so as to improve the performance of the racket and to prevent from any possible hurt to the player's hand.

CLAIMS

1. A shock absorbing racket including a frame for setting of catgut string to form a striking surface, with both ends formed into a shaft extending backward along axial direction; a racket handle connected to said shaft of said frame by means of sleeve joint; and characterized in that said racket handle is an elongated hollow rod having an inner space made thereinside along axial direction for setting therein of said shaft of said frame, wherein a cushion socket made of elastic material is set between said racket handle and said shaft, and a spring element is set inside said racket handle to pull up said shaft, so as to substantially absorb shock resulted during striking against a ball.
2. A shock absorbing racket as claimed in claim 1, wherein said cushion socket is a hollow body having thereinside an air sac for air inflation to provide a pressure made according to personal physical condition.
3. A shock absorbing racket as claimed in claim 1 or 2 wherein said spring element is preferably made of a tension spring with both ends respectively connected with said shaft and said racket handle to serve as a shock absorber.
4. A shock absorbing racket as claimed in claim 1, 2 or 3 wherein

said cushion socket includes an inner circular portion and an outer circular portion, and wherein said racket handle is having thereinside a circular receiving chamber for axial positioning of said cushion socket.

5. A shock absorbing racket as claimed in any preceding claim, wherein said cushion socket includes an inner circular portion and an outer circular portion having, said inner and outer circular portions comprising respectively a plurality of noses, and wherein the inner wall surface of said racket handle and the outer wall surface of said shaft are respectively arranged to provide a plurality of notches for engagement with the noses of said inner circular portion and said outer circular portion respectively so as to let said cushion socket be axially positioned.

6. A shock absorbing racket as claimed in any preceding claim, wherein said shaft is having a bolt hole made at the bottom end in a fixed range, and said racket handle is also having a bigger bolt hole made at its bottom end for connection thereto of a screw cap by means of screw joint, said screw cap being simultaneously connected with one end of said spring element at its inner side, said spring element being fixedly coupled with a bolt neck at the other end, said bolt neck being to screw up with said bolt hole of said shaft.

7. A shock absorbing racket as claimed in any preceding claim, wherein said racket handle includes an aperture at the front end, having an opening made by one said of said aperture, and wherein a sliding track is made on said racket handle along axial way parallely disposed by both sides of said opening for positioning of a slide block by means of slip joint to cover said opening and to form into a part of said racket handle, so as to facilitate the replacement of said cushion socket..
- 8A shock absorbing racket as claimed in claim 7, wherein a rigid hoop is mounted to bind up said slide block with said racket handle.
9. A shock absorbing racket as claimed in any preceding claim, wherein rubber ring is provided to axially mount on said shaft at the front of said aperture to seal the gap between said aperture of said racket handle and said shaft so as to prevent from entrance of water or dust.
10. A shock absorbing racket which is substantially as herein described in relation to the accompanying drawings.